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EFFECTS OF VERBAL AND VERBAL/MANUAL MODES OF COMMUNICATION ON CONTROLLING BEHAVIOR EXHIBITED BY HEARING MOTHERS WHILE INTERACTING WITH THEIR DEAF CHILDREN

BY

KRISTINE MARIE LARSEN

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled

Effects of Verbal and Verbal/Manual Modes of Communication on Controlling Behavior Exhibited by Hearing Mothers While Interacting with their Deaf Children

submitted by Kristine Marie Larsen

in partial fulfilment of the requirements for the degree of
Master of Science
in Speech Pathology

DEDICATION

For my parents

and in loving memory of my grandfather

ABSTRACT

Previous research has suggested that mothers of hearing-impaired children display more controlling types of behaviors while interacting with their children than do mothers of normal-hearing children. It has been hypothesized that reliance on oral modes of communication may result in this maternal compensatory response to the deaf child's perceived socio-communicative deficits. The present study attempted to assess the effect of an additional mode of communication, sign language, on degree of directiveness exhibited by four hearing mothers while interacting with their preschool-aged, profoundly hearing-impaired children. Each dyad was videotaped interacting in thirty minute free play situation during which the mothers alternated, at the experimenter's request, in their use of either speech alone or speech plus manual communication. Maternal utterances were classified as being controlling or non-controlling in function. The controlling utterances were further categorized according to the degree of constraint placed upon the children to respond. Indications of both overall proportions and types of controlling behavior were obtained.

Results indicated that communication mode did not have a systematic effect on the proportion of controlling utterances used by these mothers.

Differences in type of controlling behavior, based on communication mode changes, were evident in three of the dyads. High constraint directives and questions predominated throughout the interactions, however, their percentage of occurence increased when oral speech was relied upon and decreased when the use of sign language was permitted. Conversely, questions with moderate and low constraint values fluctuated in a reciprocal fashion. These results are discussed in the context of several theories of maternal control, including whether maternal intent is to control child behavior or to maintain conversational interaction.

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CHAPTER 1

INTRODUCTION

The process of parent-child interaction has become a recent focus of researchers interested in the impact of environmental variables on child language development. Results of such research have provided evidence which indicates that various aspects of maternal speech may positively or negatively influence rates of child language acquisition (White & White, 1984). Specifically, several authors have reported that mothers of children who displayed socio-communicative deficits exhibited higher degrees of directive or controlling behavior while interacting with their children than do mothers of children who are developing normally. Exposure to a maternal controlling style, as evidenced by the use of behaviors such as questions and commands, has been correlated with decelerated rates of child language acquisition (Newhoff & Browning, 1983). Results describing high degrees of maternal directiveness have been replicated across a wide variety of handicapping conditions which have an influence upon the development of social and linguistic behavior (Cross, Johnson-Morris & Nienhuys, 1980; Kogan, Wimberger & Bobbit, 1969; Bondurant, Romeo & Kretschmer, 1983). Thus, these children are

potentially at risk for socio-communicative delay not only by virtue of their handicapping condition, but also as affected by maternal interactive behavior.

Children with severe or profound hearing loss are particularly vulnerable to communicative deficiency. The relative inaccessibility of oral speech to the majority of such children often results in early interactions with hearing parents that are limited in both quality and quantity (Ling, 1984). The hearing mother's adoption of a controlling interactive style may further jeopardize the social and communicative growth of the deaf child.

Hearing mothers who rely on speech alone to communicate with their deaf children exhibited more controlling behavior than do mothers of normal-hearing children. (Cheskin, 1982; Brinich, 1980; Wedell-Monnig & Lumley, 1980; Heggeler, Watson and Cooper, 1984; Schlesinger & Meadow, 1972). This propensity is apparent while utilizing a communication mode that may restrict the mother/child dyad's ability to interact fluently and functionally. It was consequently hypothesized that augmentation of the pair's communication base through the addition of sign language may result in a reduction in the hearing mother's controlling behavior (Brinich, 1980).

The intent of this study was to examine the effects of two different modes of communication (verbal versus verbal/manual communication) on the controlling behavior exhibited by hearing mothers while interacting with their deaf children. Free play interactions of four hearing mother/deaf child dyads were videotaped in a laboratory setting for analysis. At regular intervals throughout the interactions, the mothers were requested to vary their communication mode by alternating the use of speech alone and speech presented simultaneously with sign language. Maternal behavior was analyzed regarding the proportion of controlling and non-controlling utterances relative to the two communication mode conditions. In addition, a more detailed assessment of maternal controlling behavior was undertaken so as to identify more subtle differences in the types of controlling utterances the mothers used as a function of communication mode.

A review of the literature relevant to this study is presented in the following chapter. Chapter 3 presents information regarding a pilot study and the effect of the results obtained on the main research project, in addition to the research questions which were investigated.

CHAPTER 2

REVIEW OF LITERATURE

The Relationship Between Early Socio-Communicative Interaction and Linguistic Development

The nature and quality of early parent-child interaction has been reported to be important to children's linguistic (Cross, 1984), cognitive (Slater, 1986), and psychosocial (Meadow, 1968) development. Research regarding early language acquisition, in particular, has indicated that parent-child socio-communicative interaction provides the primary context within which linguistic and conversational skills are learned, rehearsed and mastered (Conti-Ramsden, 1985; McLean & Snyder-McLean, 1978; Ratner & Bruner, 1978). The nature of that interaction has been described as transactional (Bell, 1968; McLean & Snyder-McLean, 1978). Transactional theory proposes that the behavior of one interactant affects and is affected by the behavior of another (Bell, 1968). This bidirectional view of social interaction is a departure from the more traditional view of the child as a passive, non-initiating participant in early communicative relationships. Research with infants and preschool-aged children has provided evidence for transactional theory, leading to the acknowledgment of the child as an active and equal participant in social

The nature of the language used by adults in early interactions with normal language-learning children has been well-documented (Conti-Ramsden, 1985). Interactions between mothers and their normally developing children have been described as being reciprocal and facilitative in nature, with maternal input being syntactically and semantically simplified (Snow, 1972), repetitive and fluent (Broen, 1972), and expansive upon or semantically related to previous child utterances (Lieven, 1984). These and other features of adult speech have been identified as exerting either positive or negative influence on child linguistic development. For example, Nelson, Carskaddon, and Bonvillian (1973) reported that use of expansions, particularly when semantically related to the child's focus of attention or previous utterance, correlates positively with accelerated rates of normal language acquisition. In contrast, reliance on utterances which function to change topics or divert child attention from current activities has been related to lower rates of language development (Snow, Midkiff-Borunda, Small & Proctor, 1984). Further, Cross (1984), in her review article, cited several studies which concluded that parents of language-impaired children do not display a similar volume of contingent responses while interacting with

their children when compared to parents of normal language-learning children. While a cause-effect relationship has yet to be established between parental linguistic input and impaired language development in children, Cross (1984) asserts that modification of such adult interaction behavior may positively influence future communicative gains of the delayed child.

The effect of the social and linguistic environment provided by mothers and other caregivers on child linguistic output may also be exemplified in the interactive style adopted by the adult. Many studies have found that higher degrees of directiveness resulted in decelerated rates of language learning as compared to more child-centred maternal styles (Cross, 1984; Lieven, 1984). Conversely, non-controlling maternal styles have been shown to have a positive effect on child socio-communicative behavior. This has been particularly clear with communicatively impaired populations. Mirenda and Donnellan (1986) compared the caregiver use of directive (adult-directed) and facilitative (child-directed) interactive patterns and their effects on the linguistic behavior of twelve adolescents who had been diagnosed as either mentally retarded or autistic. Their results revealed that all of the subjects initiated and spontaneously commented

on topics and questioned their partners to significantly higher degrees when caregivers adopted a facilitative, non-controlling interactive style. When the adults interacted with a directive style, the subjects tended to rely on a conversational pattern which was structured such that the adult posed questions and the adolescent responded. Thus, the authors suggested that contextual factors such as adult interactive style may be critical considerations in the evaluation of interaction research and that differences in degree of directiveness may significantly influence the social and linguistic behavior displayed by communicatively handicapped populations.

Effect of Child Handicap on Maternal Interaction Style

Recognizing the potential effect of caregiver interaction style on child socio-communicative development, researchers have attempted to identify differences in interaction patterns between mothers with normally developing children and mothers with handicapped children. Mirenda and Donnellan (1986) contend that if even a portion of the child's linguistic and conversational deficits can be attributed to, or are influenced by, early social interactions with the mother, programming focusing on adjusting maternal style to the needs of the

handicapped child may glean positive results in the form of higher levels of child communicative competency.

Researchers have studied mother-child interaction involving children with a variety of handicapping conditions including mental retardation and cerebral palsy (Hanzlik & Stevenson, 1986), physical handicaps (Kogan & Tyler, 1973), autism (Mirenda & Donnellan, 1986), Down syndrome (Petersen & Sherrod, 1982), delayed language (Bondurant, Romeo & Kretschmer, 1983), disordered language (Lasky & Klopp, 1982), as well as hearing impairment (Neinhuys, Cross & Horsborough, 1984). Following are summaries of two such studies which targeted very different subject populations. Their results typify those found with research involving each of the handicapping conditions listed above. Specifically, differences do exist between the interaction patterns of parents with children who present with normal and impaired development, particularly with regard to maternal directive behavior.

Hanzlik and Stevenson (1986) examined mother-child interactional differences among dyads with children who were a) mentally retarded-cerebral palsied (mean CA 21 months; mean MA 11.6 months), b) mentally retarded (mean CA 21.8 months; mean MA 12.4 months), c)

non-retarded, matched for chronological age and d) non-retarded, matched for mental age. Ten mother/child pairs were included in each of the four groups. Results were based on analysis of a 15-minute videotape of each dyad engaged in free play with a standard set of toys in their own home. Maternal behavior was coded according to the use of commands, command-questions and praise. Child behaviors included independent play, compliance and competing behavior. Each member of the dyad was also scored as to the incidence of questions, negatives, verbal interaction, nonverbal interaction, physical contact and overall level of behavior. Results indicated that the two disabled groups of children demonstrated lower overall levels of behavior and exhibited fewer instances of verbal interaction than their non-retarded peers. Mothers of the two groups of handicapped infants used significantly more commands when communicating with their children than did mothers of the non-retarded children. Further, mothers of the cerebral palsied children used a higher proportion of command-questions than the two groups of mothers with normally developing children. In summary, the disabled children participated far less actively during the interactions, and their mothers displayed more controlling types of verbal behavior than mothers of normally developing children.

Bondurant, Romeo and Kretschmer (1983) set out to identify any differences that may be present in maternal speech to children with delayed language skills versus children with age-appropriate language development. Their subject sample consisted of fourteen children who had been diagnosed with expressive language delays of at least one year and their mothers, and fourteen age-matched children who displayed normal language development and their mothers. The children ranged in age from two to five years and demonstrated no delays in physical, intellectual, educational or psychosocial development. Each dyad was audiotaped during a free play situation and a structured, construction-type task. The resulting transcripts were analyzed according to the mothers' use of reports, comments, questions, directives, acceptance utterances and rejection utterances. Additionally, frequency counts of total number of utterances, utterances per minute and mean length of utterance were obtained. Several significant differences were found. When scores for the two interactive situations were combined, results indicated that mothers of the language delayed children used shorter utterances, fewer questions, fewer utterances indicating acceptance of the actions of the child, and more directives. During the free play situation in

particular, mothers of language-delayed children emitted more than twice as many rejection utterances and directives than did mothers of the children with normal language development.

There is an extensive number of studies describing parent-child interactions involving children with a variety of handicapping conditions (see Marfo, 1984). The general conclusion of these studies is that mothers of delayed or disabled children display more directive or controlling styles while interacting with their children than do mothers of normally developing children.

The issue of maternal controlling style has since been addressed directly by many researchers who have targeted a variety of linguistic behaviors in their definition of directiveness. Controlling style or the quality of directiveness has been variously defined in interactional research by the use of questions, commands, imperatives, directives, requests, instructions, elicitations, proddings, topic management and lead-taking in play situations. Such a style is considered adult-oriented in that it reflects the concerns and interests of the adult over those of the child (Newhoff & Browning, 1983). These processes function to obligate the child to respond in some

manner and, thus, control the linguistic and non-linguistic output of the child.

Maternal language that is contingent upon, rather than directive of child linguistic output, is thought to be facilitative of linguistic development (Barnes, Gutfreund, Satterly & Wells, 1983). In an attempt to explain such a relationship, Lieven (1984) posited that, when a contingent response is presented, the child can compare his/her own spontaneous utterance with that offered by the adult and extract important linguistic information. Minimal linguistic information about language can be extracted from a directive maternal style because there may be little similarity between the adult's controlling utterance and any previous utterance by the child. Thus, a directive style has been correlated with reduced rates of language learning (Lieven, 1984; Cross, 1984).

As a result of the findings of the body of research focusing on maternal directiveness, several theories as to why such a style is adopted by mothers of handicapped children have been proposed.

Theories of Maternal Controlling Style

Several underlying reasons have been posited to account for the controlling style of mothers during interactions with their handicapped children. Some

theorists have suggested that the increase in maternal control may be a reflection of the child's reduced socio-linguistic competency level, which results in an unequal partnership in conversation (Brinich, 1980; Schlesinger & Meadow, 1972). Because the mother is affected by the social behavior of her child, as suggested by the transactional theory of interaction, she may attempt to compensate for her child's socio-communicative deficits by imposing more structure on the interaction.

Other theorists have hypothesized that parental style may be more internally motivated, in that the mother may feel ineffective while interacting with her handicapped child (Goldberg, 1977; Kenworthy, 1986). When she finds it difficult to establish reciprocal communication, the mother may attempt to rectify what she perceives as communication breakdown by securing control over the interaction, thus increasing her feelings of effectiveness (Brinich, 1980).

Bell's (1971) limiting control strategy suggests that mothers may view their children's level of social activity as low relative to their expectations. The mothers may then respond by imposing greater structure via the use of directives in order to elicit a higher degree of responsiveness from their children, to prompt them to emit higher quantities and qualities of

behaviors. In this way, mothers may attempt to induce the children to achieve levels of activity which are commensurate with their expectations.

Some authors (e.g. Bondurant, Romeo & Kretschmer, 1983) have suggested that a controlling maternal style may be an appropriate adjustment to the reduced linguistic or socio-interactive skill base of delayed or disabled children. However, Lieven (1984) concluded in her review article that, regardless of what motivates the emphasis on maternal control, the adoption of a less controlling style would be more facilitative for social and linguistic development. Disproportionately high maternal use of questions and directives has been linked with slower rates of language acquisition and syntactic development (Newhoff & Browning, 1983). In addition, research has suggested that over-structuring of interactive situations and reliance on high ratios of commands and directives are likely detrimental to child acquisition and social use of language (Hanzlik & Stevenson, 1986; Newhoff & Browning, 1983).

Hearing Impairment and Maternal Interaction Style

The "basic impoverishment of deafness is not lack of hearing, but lack of language" (Meadow, 1968, p. 29). This issue of early language and communication

development is central in deaf education. Fluent communication is of particular importance in infancy and early childhood, a time when parents are generally the primary figures in a child's life. Many authors feel that it is impossible to ever recapture these early phases of linguistic development.

Deficiencies in later educational, psychosocial and intellectual performance are generally evident in deaf children, though not all hearing-impaired individuals present with such difficulties. Meadow (1968), thus, assumed that there was nothing inherent in prelingual deafness which would predispose such children to future deficits. In addition, deaf children of deaf parentage have been reported to perform at higher levels on a variety of measures of linguistic, interactional, educational and psychosocial development than deaf children of hearing parents (Brasel & Quigley, 1977; Meadow, Greenberg, Erting & Carmichael, 1981). It was, therefore, postulated that the delays which have been exhibited have been due to deficits in early interactional processes, which, in turn, have been due to the communicative constraints involved in the use of oral speech alone with deaf infants and preschoolers (Schlesinger & Namir, 1978; Quigley & Kretschmer, 1982).

In light of the socio-communicative difficulties evident in the hearing-impaired population, a growing literature has focused on the social and linguistic interaction of deaf children and their hearing mothers, who rely solely on verbal means of communication (Goss, 1970; Greenberg & Marvin, 1979; Brinich, 1980; Meadow, Greenberg, Erting & Carmichael, 1981; Cheskin, 1982; Kenworthy, 1986). Similar to studies of other handicapped populations, a prominent finding common to studies with hearing-impaired children is that hearing mothers display a high degree of controlling behavior during interactions with their deaf children. The mother's role in such interactions has been described as didactic, inflexible and intrusive in nature (Schlesinger & Meadow, 1972), resulting in few opportunities for deaf children to initiate communication and low incidences of contingent responding from their mothers (Kenworthy, 1986).
In an effort to provide some preliminary information regarding the nature of the language used by hearing mothers while interacting with their hearing-impaired children, Cheskin (1982) studied the interactions of three such dyads. Each hearing mother/deaf child (aged 2-3 years) pair was taped during an hour-long period of normal activity in their own home. Maternal utterances were coded as functioning to control child behavior,

prod or elicit child responses, describe objects or events, or engage in incidental conversation. For two of the mothers, fully two-thirds of their speech functioned to control or describe behavior. While this proportion was not as great for the third mother, the majority of her output also served these two functions. Thus, through reliance on direction and description, each of the mothers created somewhat stagnant language environments which did not encourage child use of communication as a tool for control. Cheskin suggested that while these three dyads could not be considered to be representative of a larger population, the results provided some evidence that mothers of hearing-impaired children may not be providing their children with an "optimal language-learning environment" (p. 152).

Henggeler, Watson and Cooper (1984) set out to provide more detailed information regarding what form maternal control took in both verbal and nonverbal modes, although none of the subjects had received training in sign language. Fourteen deaf and an equal number of age- and gender-matched hearing children and their mothers were videotaped during one free play and one structured, teaching-task situation. Transcripts of maternal behavior were coded as to the use of verbal control (e.g. attention devices, directives, prohibitives, interrogatives) and nonverbal control

(e.g. manipulating accessibility of objects, manipulating attention to the speaker or surroundings, guiding behavior). Results of the analyses found no significant main effects in the use of controlling behavior between the subject groups for the teaching situation. However, individual indices of nonverbal control were used significantly more often in the deaf child dyads during this task. Results for the free play condition were clear. The mothers of the deaf children exerted significantly more control, both verbally and nonverbally, during this condition than the mothers of the hearing subjects, even though the total number of maternal utterances per sample for each group were similar.

Brinich (1980) initiated a descriptive study comparing the interactions of hearing mothers with 20 hearing and 40 deaf children, using a 55-category behavioral analysis system. All of the children were 5-6.5 years of age and had no diagnosed handicapping condition other than hearing loss. The hearing-impaired children, whose mothers used verbal speech only, were described as being profoundly and prelingually deaf. Each dyad was videotaped in a semi-structured play situation which was interrupted by a refreshment sequence. At that time, a letter was given to the child indicating that a surprise was

located in a specified object in the room. The mother then assisted the child in finding the surprise, resulting in the 5-minute videotape sample which was isolated for analysis. Results indicated that mothers of the deaf children utilized more questions, instructions and attention-related behaviors than did the mothers of the hearing children. Brinich compared these results to those found by other researchers who had studied mentally retarded populations and found striking similarities in maternal output, even though his hearing- impaired subjects were not retarded. He, therefore, suggested that the adoption of a maternal controlling style may reflect communication breakdown resulting from reliance on verbal modes of communication, rather than intellectual limitation.

Thus, Brinich (1980) hypothesized that if the hearing mother and the deaf child were provided with an alternate or additional mode of communication, the child's ability to contribute on an equal basis to conversational interactions may improve. The child may then display socio-communicative behaviors which more nearly match those expected by the mother. For her part, the additional mode of communication may enable the mother to feel more effective while socially relating to her child, empowering her to be better able to avoid or rectify communication breakdown. A

reduction in the mother's compensatory processes may then become apparent, as evidenced by a reduction in controlling behavior.

The additional mode of communication advocated by the Total Communication philosophy is sign language or manual communication, which is presented simultaneously with verbal speech. Early introduction to a total communication program may help to surmount the barriers that typically restrict contact between hearing parents and their deaf children from a very young age. The positive long-term effects of early use of verbal and manual communication have been well-documented. Deaf children who have had early exposure to sign language, as introduced by either hearing or deaf parents, perform significantly better on tests of linguistic development, academic achievement and psychosocial adjustment than children who have been exposed solely to verbal communication (Stuckless & Birch, 1966; Vernon & Koh, 1970; Brasel & Quigley, 1977; Meadow et al., 1981). These authors suggested that the delays exhibited by deaf children who had no opportunity to take advantage of manual forms of communication may have been a consequence of deficits in early interactional processes.

The research described in the following chapters explores the issue of the effect of communication mode on maternal interaction style with deaf children.

CHAPTER 3

PILOT STUDY and RESEARCH QUESTIONS

Pilot Study

A pilot study was completed to determine if hearing mothers would exhibit a higher frequency of controlling behavior when using speech only as compared to speech plus sign language. The mothers were observed while interacting with their deaf children during free-play and goal-oriented activities. It was hypothesized that the latter activity would subject the dyad to a greater degree of communicative stress, and thus, predispose the mothers to engage in higher frequencies of controlling behavior. In addition, the incidence of contingent queries (requests for repetition or clarification) as used by both members of the dyad, was tracked as a measure of communication breakdown, and was then considered in relation to the communication mode used.

The pilot study addressed the following research questions:

1. Will hearing mothers display a higher proportion of controlling behavior when sign language is prohibited than when both verbal and manual modes of communication are allowed?
2. Will hearing mothers display a higher proportion of controlling behavior during

goal-oriented activities than during free play situations?

3. Will a higher proportion of contingent query occur when sign language is prohibited than when verbal and manual modes of communication are used simultaneously?

The original intent was to obtain a group comparison, contrasting the controlling behavior of two matched sets of hearing mothers of deaf children, one group which routinely used speech and sign language simultaneously and another which used speech alone. However, the lack of availability of a sufficient number of hearing-impaired subjects did not allow for the formation of homogeneous comparison groups. Therefore, a single-subject Alternating Treatments Design, as described by Barlow and Hersen (1984), was used in the investigation of the research questions. This design requires no formal baseline and features the alternation of two or more conditions or treatments. Application of the communication conditions (verbal only and verbal plus sign language) and interactive situations (free play vs. goal-oriented) were counterbalanced across experimental sessions in order to control for order, carryover and sequence effects. Appendix A displays a schematic illustrating each subjects' schedule of participation.

Subjects

Two hearing mother-deaf child pairs participated in the pilot project. One dyad was obtained from the population served by the Preschool Program for the Hearing-Impaired at the Glenrose Rehabilitation Hospital and the second from the Association for the Hearing Handicapped. The children were both within one month of four years of age and presented with severe-to-profound hearing losses bilaterally. They were each enrolled in their respective preschool programs at the time of the study. Both dyads had been using sign language to augment speech for two years prior to participation.

Procedures

Each mother-child pair was seen on two consecutive days at the Department of Speech Pathology and Audiology at the University of Alberta. The experimental sessions were conducted in a research suite in which the dyads could be sound monitored and videotaped through a one-way mirror. The mothers were equipped with an FM receiver which allowed for communication between the experimenter and the mothers.

Each day of participation consisted of two 20-minute interactions, one being free play in nature and the other being goal-oriented. At five-minute

intervals during the interactions, the mothers were instructed to use either verbal communication alone or verbal/manual communication, on an alternating basis.

Scoring

All interactions were transcribed verbatim from videotape. Each transcript was then analyzed with a binary coding system delineating maternal controlling and non-controlling behavior. Maternal controlling behavior was defined as any utterance that was presented in interrogative or non-interrogative form (e.g. imperatives, questions, calls for attention), the intent of which was to elicit a response from the child (verbal, gestural, eye contact or action), or to direct or control the child's behavior (linguistic, physical or attentional). Maternal non-controlling behavior included any behavior, the intent of which was something other than eliciting a response from the child (e.g. labelling, providing descriptions, self-talk). The third dependent variable, contingent query, referred to any nonspecific or specific request for repetition, confirmation or specification (Gallagher, 1981).

Results and Discussion

Results of analysis using the above scoring system revealed no clear trends for either dyad in the

incidence of maternal control across the two communication mode conditions. Controlling behaviors occured with frequencies ranging from 29-76% during the verbal communication condition and from 38-74% during the verbal plus manual communication condition. A slight significant difference, as confirmed by a t-test ($t = 3.183$, $p = .0152$), between the play and goal-oriented situations was found, with the higher frequency of controlling behaviors occuring during free play, contrary to the original hypothesis. A further analysis of the transcripts revealed that a likely reason for this finding was the nature of the structured task itself. The goal activity resulted in the children becoming, in essence, captive interactants for their mothers in that there were no materials or events to distract the children from the assigned goal. However, during the free play situation, the children occasionally attempted to engage in independent play or communicated disinterest in adult-chosen activities. Regardless, the mothers typically continued to try to maintain interaction, necessitating the use of directive behavior.

As predicted, contingent queries occurred more frequently during the Verbal Only communication mode than when simultaneous use of speech and sign language was permitted. Further analysis revealed that,

regardless of communication mode, the vast majority of the requests for repetition or specification were initiated by the mother. In contrast, the children seldom overtly indicated that they did not understand their mothers' messages. Thus, breakdowns in communication, as defined in this study, were more frequent when the child initiated communication. Although Garvey (1981) obtained results indicating that normal-hearing children, who are at a similar linguistic level to that of the children involved in the pilot project, make use of contingent queries during conversations with adults, hearing-impaired children may not demonstrate the conversational interest level or the pragmatic abilities necessary for the use of this discourse strategy. While further research would be required to confirm or deny this, the appropriateness of using contingent query as a measure of communication breakdown was questionable and, thus, it was not included in the main study.

It was hypothesized that the two-category scoring system was not refined enough to discriminate more subtle differences which may have existed between the communication conditions. Therefore, a more fine-grained behavioral scoring system of maternal communicative behavior, an modified version of that used by McDonald and Pien (1982), was used to

re-analyze the transcipts of the second day of interactions of both pilot dyads. The system is described in detail in Chapter 4 and will be reviewed only briefly here. The interactional intent of maternal utterances was targeted by this system. Four types of directives and three groupings of a total of eight questions were delineated for scoring. The groups of questions were differentiated by the level of constraint (high, moderate and low) placed on the child to respond.

Information regarding the proportion of controlling to non-controlling behavior had already been established with the original scoring system. The proportion of controlling behaviors was further broken down into percentages of specific types of linguistic behaviors (i.e. types of directives and types of questions by level of constraint) used by the mothers while interacting with their hearing-impaired children.

Results revealed some interesting relationships among the percentages of the different levels of controlling behavior relative to communication mode. The mothers' use of directives appeared to fluctuate negatively with the use of moderate constraint questions. The use of directives increased during the Verbal + Sign condition, while the use of moderate constraint questions decreased. The opposite effect

was evident during the Verbal Only condition. These results were replicated across the free play situation for both dyads with a moderate degree of consistency, although the results of Dyad #1 were far more uniform.

Directives carry a high degree of obligation for the child to respond and often delimit the action the child must perform or the information which s/he can appropriately provide (e.g. "You sit down over here." "Tell me which one you want."). Moderate constraint questions, termed 'real questions', are those which seek to gain unknown information from the child. It was this type of question that the mothers appeared to rely on to a greater extent during the Verbal Only condition. When the use of manual communication became an option during the Verbal + Sign condition, the mothers made greater use of directive utterances. This may be due to the greater intelligibility of maternal utterances for the child provided by the additional linguistic input mode of sign language. The mothers may have realized that when sign language was used to augment speech, the probability was greater that their children would understand their messages and respond appropriately. They, then, took the opportunity to maintain interaction by directing the flow of activity of both participants. However, when sign language was disallowed, the mothers may have felt less likely to be

reinforced for the use of directives in the form of appropriate child responses because of the restricted line of communication afforded by speech alone. They, therefore, sought to maintain interaction by adopting the somewhat more child-centred approach of asking questions about activities and events for which they did not have the answers. Such questions often called for the children to express choices (e.g. "Which one do you want?") or to make more explicit the nature of their current activities (e.g. "What are you trying to do with that?").

Further, it was noted that real questions tended to occur in clusters of several in succession, frequently not allowing the child sufficient time to respond. For both dyads, multiple presentations of real questions which were not separated by more than one other type of utterance occured with frequencies ranging from 50-100%, with a mean of 75%. That is, three of every four real questions used by these mothers occured in a series or sequence of real questions. Such a pattern may have constituted these mothers' compensatory attempts to continue their contribution to the interaction, particularly during the Verbal Only condition, where higher frequencies of real questions were used.

Less consistent results were obtained using the revised scoring system for the goal situation. The relationships among the controlling categories were not as evident, particularly for Dyad #2, and there did not appear to be differential effects on the dependent variables based on communication mode. In light of the limited additional information regarding maternal controlling behavior obtained from the goal-oriented task, this second interactive situation was not retained for the main research project.

Research Questions

The pilot study data revealed no clear difference in maternal controlling behavior as a function of communication mode but this remains to be substantiated with a larger number of subjects. Based on the analysis utilizing the more refined behavioral scoring system, there appeared to be potential for subtle differences in, and relationships among, the types of controlling utterances used relative to whether or not sign language was excluded from the interaction. In light of these two issues, the experimental questions for the main thesis project were re-defined as follows:

1. Will hearing mothers display a higher proportion of controlling behavior when sign language is prohibited than when both verbal and

manual modes of communication are allowed?

2. Will the types of controlling behaviors used by hearing mothers of deaf children vary as a function of communication mode condition? Specifically, will there be an inverse relationship in the frequency of directives and moderate constraint questions, indicating changes in maternal interactive style as a function of communication mode?

CHAPTER 4

DESIGN AND METHOD

Subjects

Four hearing mother/deaf child dyads participated in the study. They were obtained by submitting a general enquiry for subjects to the Association for the Hearing Handicapped (AHH) and the Preschool Program for the Hearing-Impaired (PPHI) at the Glenrose Rehabilitation Hospital, both located in Edmonton. The following criteria were presented to each of the programs:

1. The children should be aged 4-4.5 years.
2. The children should present with severe to profound hearing losses bilaterally.
3. The children should have no other handicapping conditions.
4. The mothers should have been using sign language in addition to speech to communicate with their children for at least one year prior to participation in the study.

Two dyads were obtained from each agency. All four children were currently enrolled in their respective programs. The AHH implements Total Communication programming with it's entire population while the Glenrose program uses sign language when deemed

necessary on an individual basis.

The four mothers ranged in age from 24-36 years, with education levels ranging from high school to partial completion of university undergraduate work. Two of the mothers worked outside the home, one was a part-time university student, and the fourth was a full-time housewife. Mothers #1, #2 and #3 were married, while Mother #4 was single parent who lived with her mother. All of the mothers had been using sign language together with speech to communicate with their hearing-impaired children for 2-3 years prior to participation in the study. Details of maternal as well as spousal characteristics are provided in Table 1.

Table 1. Maternal and Spousal Characteristics

	Mother #1	Mother #2	Mother #3	Mother #4
Age	25 years	36 years	29 years	24 years
Maternal Education	3 years university	2 years technical	high school	high school
Maternal Occupation	housewife/ student	housewife	bookkeeper	word-processor
Sign Language Experience	2 years	2 years	2 years 3 months	3 years
Spouse Age	28 years	41 years	35 years	[single parent]
Spouse Education	technical school	technical school	high school	
Spouse Occupation	farmer	self-employed	operations manager	

The children, three girls and one boy, ranged in age from 4 years to 4 years 8 months. Each of the children were within the criterion age range at the time of initial contact, however, scheduling difficulties resulted in Child #3 being beyond this range at the time of participation. All had prelingual, severe to profound hearing losses (i.e. unaided responses greater than 80 dB at 500, 1000 and 2000 Hz) as assessed by the Audiology Department of the Glenrose Rehabilitation Hospital. Recent audiograms for each of the children are presented in Appendix B. All of the children had been fitted with post-auricular hearing aids which were used in conjuction with Personal FM systems. It was not known that standardized language testing was not available from the Association for the Hearing Handicapped for Children #1 and #2 until after their participation in the study was complete. Language samples were, therefore, obtained from the videotapes acquired from this study and were analyzed to assess level of language functioning. Results of these analyses and those reported by the Preschool Program for the Hearing Impaired for Children #3 and #4 indicated that each of the children were functioning at Brown's Stage II, based on mean length of utterance (MLU), as described by Miller (1981). Child #1 was the middle child of

three children, her younger brother also being hearing impaired. Child #2 was adopted at 22 months of age and had five older adoptive siblings, none of whom had hearing losses. Children #3 and #4 were only children. None of the children presented with any handicapping conditions other than hearing loss. Child characteristics are summarized in Table 2.

Table 2. Child Characteristics

	Child #1	Child #2	Child #3	Child #4
Age	4 - 7	4 - 4	4 - 8	4 - 0
Gender	female	female	male	female
Brown's Stage	II	II	II	II
Hearing Loss	severe-profound	profound	severe-profound	profound
Siblings	middle of three	youngest of five (adopted)	only child	only child
Preschool	AHH	AHH	PPHI	PPHI

Procedures

The four dyads were scheduled to attend the University of Alberta Speech Pathology and Audiology Department for two experimental sessions, one on each of two consecutive days. Subject scheduling restrictions required the videotaping of both sessions for Dyad #3 in a single day. A refreshment break of approximately 30 minutes was provided between sessions.

Each experimental session consisted of a free play situation which was completed in a playroom containing a standard set of toys selected to be age-appropriate

for the children. The play took place on a blanket placed on the floor in the middle of the room. A small table and two child-sized chairs were located off to the side of the play area and were available for use if desired by the dyad. Videotaping of the interactions took place through a one-way mirror from an adjacent observation room. (See Appendix C for a list of the videotape equipment and toys used.)

Each mother was advised of the location of the camera relative to the mirror and was requested to ensure that the majority of the play be restricted to the blanketed area so that both members of the dyad would remain within camera range. Each mother was then asked to play with her child as she normally would.

Over the course of the interactions, each mother was instructed to use either verbal communication alone or verbal/manual communication, on an alternating basis. This was accomplished by equipping the mothers with an FM receiver which allowed the investigator to indicate, by remote, when to change communication mode. Each communication mode condition was seven and one-half minutes in length. Four conditions were completed during each experimental session, making each interaction thirty minutes in length. If the mothers inadvertantly used a formal sign during the verbal communication condition, and did not indicate an

awaremess of such, the experimenter was prepared to immediately remind the mother to refrain from any further use of manual communication for the duration of that condition. However, at no time was such a reminder necessary for any of the four dyads.

Design and Dependent Variables

An Alternating Treatments Design (Barlow and Hersen, 1984), the purpose of which is to compare two or more experimental conditions within a single subject, was utilized and replicated across the four mothers. The design allows for the rapid alternation of two or more treatments or conditions, which need not be therapeutic in nature. Simply advising subjects of which condition they are in, as was accomplished in this study through the use of the FM system, is sufficient to ensure discriminability between conditions (Barlow & Hersen, 1984). In this study, the communication mode conditions of Verbal + Sign and Verbal Only were alternated within each thirty minute experimental session. The process was repeated on the second day so as to counterbalance the order of implementation of the conditions, thus controlling for order and sequence effects. A visual representation of the subjects' participation is presented in Appendix D.

Dependent variables included several elements of maternal discourse which represented controlling behavior. They consisted of an amended behavioral category system based on that used by McDonald and Pien (1982) in their descriptive study of normally developing children. The behaviors were designed to reflect the maternal intent to control child behavior as opposed to the intent to elicit conversation. They were referred to globally as directives and questions. Directives carry high constraint levels as they specify, unequivocally, the response expected from the child and allow for no substitutions. Three categories of questions were defined and grouped based on level of response constraint. High, moderate and low constraint questions were circumscribed according to how specific a response was required and, in MacDonald and Pien's terms, "the weight of the [child's] responsibility to answer" (p. 344). Following are the four groupings of maternal controlling behavior together with corresponding examples:

1. Directives - utterances which elicit or delimit verbal or physical behavior.
   a) direct commands - specify behavior and agent and allow for no alternatives.
      e.g. "Put that away."

"Bring the car over here."

b) indirect commands - requests, suggestions, complaints, demands, threats, disapprovals; may be less explicit than direct commands.

e.g. "Why don't you give me that?"

c) directive prompts - attempt to force a response to a previously presented command.

e.g. "You come sit over here." (pause) "Okay?"

d) attention-getting devices - attempt to elicit attention to the self or an object or event.

e.g. Call child's name.
"Look at this."

2. High Constraint Questions

a) repair questions - attempt to elicit repetition or clarification of information from the child's previous utterance; attempt to repair communication breakdown.

e.g. "What?"
"You want me to put it where?"

b) test questions - questions for which the mother already knows the answer; usually used in an attempt to have the child demonstrate knowledge.

e.g. "What colour is this?"

"Do you think this is the big doll's bed?"

c) question prompts - attempt to force a response to a previously presented question.

e.g. "What's that?" (pause) "Hm?"

"Is that a train?" (pause)

"A train?"

3. Moderate Constraint Questions

a) real questions - questions which function to gain unknown information; usually attempt to elicit information regarding activities, intentions and wants of the child.

e.g. "Which one would you like to play with?"

"Do they like to go down the slide?"

4. Low Constraint Questions

a) verbal reflective questions - repetition or paraphrase of a previous child utterance, signed or spoken, that does not add new information; passes the speaking turn.

e.g. i) Child - "He likes to eat bananas."

Mother - "He does?"

ii) Child - "Want play ball."
Mother - "Oh, you want to play with that?"

b) action reflective questions - description of the activity of the child, presented in question form; does not request or provide information; passes the speaking turn.

e.g. i) Child - takes toy from mother and plays with it.
Mother - "Your turn?"

ii) Child - gives a bottle to a doll.
Mother - "Feed the baby?"

c) report questions - comment on or inform the child of an event about which s/he may or may not be aware; does provide new information.

e.g. "His lights don't work, do they?"

d) permission requests - offers of assistance; requests for permission to help.

e.g. "Would you like mom to do it?"
"May I help with that?"

Reliablity

Transcription All of the interactions were transcribed verbatim from videotape by an undergraduate

student in Speech Pathology. Neither capitalization nor punctuation were included on the transciptions, so as to avoid influencing the judges' scoring.

Point-by-point reliability was calculated for both words spoken by each mother and utterance boundaries. For the words spoken count, each word in each maternal utterance was considered separately and considered to be the same (an agreement) or different (a disagreement). Utterance boundaries were scored according to which word the judges began and ended each utterance with. If both words were the same across both judges, it was considered an agreement. If one or both of the words differed, a disagreement was scored. Reliability for both of these measures was calculated by dividing the number of agreements by the number of agreements plus disagreements, and then multiplying by 100 (McReynolds & Kearns, 1983). Guidelines which were used in the transcription process and examples of reliability measures are provided in Appendix E.

Interjudge reliability scores, based on 15% of the videotapes, were 98% for the Words Spoken (range of 90-100%) and 95% for Utterance Boundaries (range of 88-100%, with the exception of a single, one-minute sample rating of 67%).

Scoring of Controlling Behaviors Reliability for the scoring of the dependent variables was established

between the prinicipal investigator and an undergraduate student in Speech Pathology. Point-by-point reliability measures, as described above, were completed for 15% of the videotapes. Reliability scores ranged from 82.9% to 89.5%, with the exception of one sample rating of 70.7%. Overall reliablity for scoring was 84.4%

CHAPTER 5

RESULTS

Maternal Use of Sign Language

In an effort to demonstrate the distinct nature of the two communicative conditions, the amount of maternal use of sign language was tracked. Table 3 presents the range and average percentages of verbal utterances that were accompanied by sign language during each communication condition.

Table 3. Percentage of Verbal Utterances Accompanied by Sign Language

	Verbal + Sign		Verbal	
	range	average	range	average
Mother #1	58-79	68	0-4	2
Mother #2	70-79	75	0-1	.4
Mother #3	48-58	54	0	0
Mother #4	20-47	32	0-1	.4

With the exception of Mother #4, each of the mothers used sign language together with verbal communication for over half of their utterances during the Verbal + Sign condition. In contrast, only a small fraction of verbal utterances were accompanied by sign when manual communication was disallowed. These results demonstrate that a difference existed between the experimental conditions relative to the mode of

communication used by the mothers.

Amount of Maternal Talk

An investigation of the amount of maternal talk was undertaken to ascertain the possible effect of communication mode on this aspect of each of the mother's interactions with their children. The total number of utterances used by each mother per 30 minute interaction ranged from 237-293 for Dyad #1, 497-546 for Dyad #2, 439-466 for Dyad #3, and 487-595 for Dyad #4. The range and average number of utterances presented during each of the seven and one half minute communicative conditions is shown in Table 4 below.

Table 4. Number of Utterances per Communication Condition

	Verbal + Sign		Verbal	
	range	average	range	average
Mother #1	64-77	70	42-80	62
Mother #2	118-169	133	118-137	127
Mother #3	100-108	104	111-142	123
Mother #4	93-154	123	117-176	148

These results reveal that Mothers #1 and #2 spoke slightly less often during the Verbal Only condition while Mothers #3 and #4 presented a higher number of utterances during that same condition. Thus, communication mode did not appear to have a systematic impact on the amount of conversation the mothers directed toward their children.

Controlling versus Non-controlling Maternal Behaviors

Research question #1 dealt with the potential effect of communication mode on the proportion of controlling behavior displayed by hearing mothers of deaf children. Tables 5 through 12, located in Appendix F, display the results of analysis of maternal controlling behavior for each of the four dyads who participated in this study. Section A in each of the tables presents the breakdown of controlling and non-controlling utterances used by each of the mothers under each communication mode condition. Results are presented in terms of both the raw number of occurences (#) and percentage of each of these two types of utterances (%) with relation to the total number of utterances. For example, during the first Verbal + Sign condition of Dyad #1 on Day 1 (see Table 5), 69 maternal utterances were presented. Of these, 42 were controlling in nature, representing a proportion of 61%. Non-controlling utterances, 27 in all, accounted for 39% of the total.

Inspection of Section A of each of the tables revealed no systematic variation in the amount of controlling behavior by communication condition. The lack of a systematic difference in controlling utterances used by each of the four mothers during the alternating communication mode conditions can also be

seen in Figures 1 through 4 (see Appendix G). Overall, Mothers #1 and #4 presented with slightly more controlling behavior than non-controlling behavior across the two communication mode conditions during both days of participation. The opposite pattern was evident for Mothers #2 and #3, whose proportion of controlling behavior largely remained just under 50% throughout both experimental sessions.

Two parameters used in the formation of judgements regarding the significance of visually presented data, such as the line graphs displayed in Figures 1-4, involve trend and slope (McReynolds & Kearns, 1983). Trend refers to the direction of behavior change represented by the data, while slope refers to the magnitude of that change. No consistent trends in the use of controlling behavior between the two communication mode conditions, either within-subject or across subjects, are evident graphically. The slope of the lines joining the data points for each of the Verbal and Verbal + Sign conditions is slight in most cases, with overlap being evident across all four dyads. These two factors would indicate that there is no significant change in the proportion of controlling utterances used by these mothers based on communication mode.

Types of Maternal Controlling Behaviors

The second research question sought to identify any relationships which may exist in the use of varying types of controlling behaviors as a function of communication mode. Section B in each of Tables 5-12 presents the breakdown of the different types of directive behavior used by each of the mothers when exhibiting the intent to control. Raw scores and percentages of each type of controlling behavior relative to the total number of controlling utterances are displayed. The percentages of all the behaviors listed under each of the four levels of control (i.e. directives and high, moderate and low constraint questions) were summed and these figures are indicated under the heading "Total" at the bottom of each level. Thus, for Dyad #1 on Day 1 (Table 5), 57% of the controlling utterances used by this mother were directive in nature, 22% constituted high constraint questions, 19% were moderate constraint questions, and 2% carried low constraint values. The summed totals are presented in the form of bar graphs in Figures 5-8, located in Appendix G. These bar graphs represent the the types of controlling behaviors used by each mother for each communication mode condition during both of the experimental sessions. The results of each dyad will be considered separately.

Dyad #1 Results for this dyad are presented in Tables 5 and 6 and in Figure 5. On Day 1, there was some systematic variation of high constraint questions between conditions. During the first communication condition, Verbal + Sign, 22% of the mother's controlling utterances carried high constraint values. This proportion increased to 37% during the following Verbal Only phase, decreased to 25% during the subsequent Verbal + Sign condition, and then increased again to 29% during the final Verbal Only condition. The large increase during the first Verbal Only condition was due to this mother's use of repair questions. Review of the transcripts indicated that this 7.5 minute condition was largely child-directed, with the dyad engaged in role-reversal activities where the child pretended to be the mother. During these activities, the child's directive behavior was often not immediately understood by the mother, necessitating requests for repetition and clarification. None of the other levels of controlling behavior were noted to vary according to communication mode on Day 1.

The same variation in the use of high constraint questions was also evident on Day 2. High constraint questions increased during the Verbal Only conditions and decreased during the Verbal + Sign conditions. Whereas increases in the use of repair questions

resulted in the differences seen in Day 1, increases in the use of test questions accounted for the fluctuation evident on Day 2. When this mother was required to rely on speech alone, she used a higher proportion of questions which functioned to have her child demonstrate knowledge (i.e. questions such as "What's that?"). In contrast, moderate constraint questions were proportionally higher during the Verbal + Sign phases than during the Verbal Only phases. Thus, on Day 2, adult-oriented high constraint questions and more child-oriented moderate constraint questions appeared to fluctuate in a reciprocal fashion as a function of communication mode.

Dyad #2 Results for this dyad are presented in Tables 7 and 8 and in Figure 6. No systematic trends in the data outlining controlling behavior were evident for Day 1 of this dyad's participation. On Day 2, however, the use of directives was higher by percentages of at least 20% during the Verbal Only conditions than during the Verbal + Sign conditions. Nearly half of all of the controlling utterances which occured during the Verbal Only condition consisted of directives that specified precisely what response this mother wanted of her child. These resulted in the variations seen in the overall proportion of directives used on this day.

The use of moderate constraint, or real questions, increased during Verbal + Sign conditions and decreased during Verbal Only conditions. The reciprocal relationship of directives and real questions for Dyad #2 on Day 2 parallels that of high and moderate constraint questions seen in Dyad #1 on Day 2.

Dyad #3 The results for this dyad can be found in Tables 9 and 10 and in Figure 7. No trends in the use of any of the four levels of controlling behavior were evident for either day of participation for this mother/child pair. In addition, no systematicity in the use of any of the specific types of controlling behaviors was discernable across either day of participation.

Dyad #4 Tables 11 and 12 and Figure 8 contain the results of analysis for this dyad. This mother provided the most consistent trends in the percentage of use of different controlling behaviors. Most notably, her use of directives was uniformly higher during Verbal Only phases than during Verbal + Sign conditions across both experimental sessions. Review of the videotapes revealed that on Day 1, the increase in the amount of directive behaviors was partially due to an increased need for attention-getting devices. On Day 2, the difference appeared to result from higher proportional use of indirect commands through the

presentation of suggestions, complaints, and utterances indicating disapproval or the incorrectness of the child's response.

The same pattern in the use of moderate constraint or real questions that was evident with Dyads #1 and #2 was replicated on Day 1 by this dyad. That is, the proportion of use of moderate constraint questions increased during Verbal + Sign conditions and then decreased during Verbal Only conditions. On Day 2, low constraint questions varied in a similar manner. The percentages for these types of questions, particularly verbal and action reflective questions, were very low during the Verbal Only conditions and then increased during Verbal + Sign phases.

Therefore, for Mother #4, the pattern of directives appeared to fluctuate negatively with the use of moderate constraint questions on Day 1, and with the use of low constraint questions on Day 2.

Overall, directives appeared to be the controlling behavior of choice for all of the mothers who participated in this study. With the exception of one communication mode condition on Day 1 of Dyad #3, this highest level of directiveness accounted for the largest portion of controlling utterances. With some exceptions, the low constraint questions were used least frequently by all of the mothers.

As reported in Chapter 3, a tendency to cluster the presentation of real questions in series of several in succession was evident in the patterns of the mothers who participated in the pilot study. A similar analysis was completed for the four dyads of the main study. In addition to real questions, test questions and attention-getting devices were also tracked. Percentages were calculated to indicate what proportion of these types of questions were presented in clusters of two or more. The results are summarized in Table 13.

Table 13. Percentage of Question Types Presented in Clusters

	Real Questions		Test Questions		Attention Devices	
	VS	V	VS	V	VS	V
Mother #1	66	62	39	84	0	95
Mother #2	61	59	62	49	0	0
Mother #3	45	70	75	57	29	50
Mother #4	41	50	83	90	33	53

Although little systematicity is evident in these results, it appeared that Mother #4 tended to cluster all three types of questions more often when requested to interact using only speech. This is also true for Mother #1 with test questions and attention devices, and with Mother #3 with her use of both real questions and attention devices.

When the data were collapsed across communication mode conditions, the results for all of the dyads indicated that 57% of the real questions, 63% of the test questions, and 32% of the attention-getting devices were presented in clusters of two or more. Thus, there were many instances when the children in this study were presented series of questions by their mothers which often did not allow sufficient time to respond following any of the presentations.

CHAPTER 6

DISCUSSION

Controlling versus Non-Controlling Behavior

Results of this study indicated that there were no systematic differences in maternal use of controlling behavior as a function of communication mode. Contrary to the original hypothesis, none of the mothers displayed a tendency to exert more control over interactions with their children when they were not allowed to augment speech with the use of sign language. With relation to the three theories of maternal emphasis on control discussed in Chapter 2, it would appear that, for these four dyads, the use of an alternate communication system did not rectify the interactional deficits described by the theories.

Equality of Conversational Participation. Brinich (1980) postulated that an additional mode of communication, which in this study was sign language, may function to promote a less controlling socio-communicative maternal interactive style because both mother and child are better able to contribute equally to the interaction. However, review of the transcripts obtained from the four dyads who participated in this study indicated that the mothers out-communicated their children by utterance ratios

ranging from 2:1 for Dyad #1 to 8:1 for Dyad #4, with the average for the four dyads being five maternal utterances for each child utterance. These figures help to demonstrate that, in these mothers' minds and perhaps in reality, their children were not equipped to share the conversational load on an equal basis. Use of manual communication was apparently not adequate to "normalize" the children's interactive competencies. Even with the inclusion of an additional mode of communication, these children still may not have gained sufficient socio-communicative skill bases to prompt a less controlling style from their mothers. Therefore, the consistent levels of controlling behavior displayed by these mothers may not be surprising given earlier research regarding the impact of handicapping conditions on mother/child interaction. Perhaps mothers of children who present with socio-communicative deficits will adopt a compensatory, controlling style irrespective of the forms of communication available to them.

Maternal Feelings of Effectiveness. The issue of the mother's perception of satisfactory reciprocal communication between herself and her child was suggested to be central to the development of her feelings of effectiveness while interacting with her child (Goldberg, 1977). Results of this study would

imply that the use of sign language did not significantly influence these mothers' feelings of effectiveness because the expected concomitant reduction in the proportion of controlling behavior was not apparent when the addition of sign language was permitted. However, these findings do not preclude other evidence of increased feelings of efficacy as determined by alternate dependent measures. Regardless, the results reported here indicated that maternal feelings of effectiveness were not prominently affected, at least as assessed through the analysis of maternal controlling behavior.

Maternal Expectation and Child Social Activity. Bell (1971) suggested that mothers may anticipate levels of responsiveness that their children do not, in actuality, manifest during socio-communicative situations. When expected responses do not appear to be forthcoming, mothers may attempt to elicit them through the adoption of a controlling interactive style. The mothers of the children of this study apparently sought higher levels of interactive activity from their children without bias to either of the communication mode conditions they were requested to use. Some evidence for this may be found in the analysis of the tendency of some of the mothers to cluster specific types of controlling behaviors.

Results revealed that over half of the presentations of real and test questions were offered in series of two or more. Occasionally, the topic of these sequences changed mid-stream, the mother not having received, or even allowed adequate time for, a satisfactory response. Exchanges such as the following, obtained from the transcripts of this study, were not uncommon:

Mother: What's that?

Child: (vocalizes)

Mother: Is that a clock?

Mother: You see the pictures moving down there?

Mother: What's that?

Mother: Is that a bear?

Child: (vocalizes)

Mother: Who's this?

The above sample involved a series of test questions, the intent of which is to have the child demonstrate knowledge. The following provides an example of a cluster of real questions, those which attempt to obtain unknown information from the child.

Mother: Are you finished?

Mother: Are you finished?

Mother: What are you going to do with it?

Mother: Why did you spill them all out again?

Mother: What are you doing?

Mother: Hey.

Mother: What are you going to do?

Mother: What are you doing?

Apparently, these mothers were not receiving the responses that they were attempting to elicit. Their childrens' level of socio-communicative activity was not commensurate with their expectations. The mothers' response was to continue to press for child participation by maintaining their line of questioning or by asking questions on a related, new topic in an effort to prompt a reply.

In light of the theories of maternal control discussed above, it is interesting to note the circular, and somewhat self-defeating, nature of the role that these mothers adopted while interacting with their children. All of the mothers displayed a tendency to increase their conversational output during the play interactions, as exemplified by the widely disparate utterance ratios. Such a response may have been attributable to their perception of their children as not possessing the capacity to accept an equal share of the conversational floor. In an effort to increase the children's levels of social activity, the mothers then presented bursts or clusters of controlling behaviors, with the hope of inducing higher degrees of child responsiveness. However, these clusters contributed still further to the imbalance in amount of

participation of the two interactants. Thus, the strategies these mothers employed in their attempts to elicit higher levels of interactional participation also functioned to maintain, or even increase, their own level of control. This thereby reduced the children's opportunity to contribute on a more equal basis, defeating the original intent of the strategy.

Types of Controlling Behavior

McDonald and Pien (1982) propose that reliance on directives and high constraint questions reflects the maternal desire to control, whereas high proportional use of moderate and low constraint questions reflects the desire to converse. All of these behaviors obligate a response from the child within the parameters of the rules of conversation and, in this study, were considered to be controlling in nature. However, McDonald and Pien (1982) suggest that disproportionate use of behaviors that represent different levels of constraint may characterize two distinct interactional intents.

Variations in the proportions of the two groups of behaviors (i.e. directives and high constraint questions vs. moderate and low constraint questions) between communication conditions were displayed to some extent by Dyads #1, #2 and #4. On the second day of

participation of Dyad #1, negatively related fluctuations in use of high and moderate constraint questions were evident. The proportion of high constraint questions increased during the Verbal Only conditions while moderate constraint question percentages increased during the Verbal + Sign conditions. A similar pattern was seen on Day 2 of participation of Dyad #2 involving variations in the use of directives and moderate constraint questions. Dyad #4 presented with the most striking results across both days of participation. This mother's proportional use of directives remained consistently high during Verbal Only conditions through both experimental sessions. The level of directives appeared to have a reciprocal relationship with the use of moderate constraint questions on Day 1 and with low constraint questions on Day 2. The results of these three dyads suggest that, for each of the mothers, the intent to control became more paramount when the option to use manual communication was removed. The proportion of use of directives and high constraint questions was consistently higher than the use of moderate and low constraint questions, regardless of communication mode. However, when sign language was permitted, and a pattern of communication more accessible to the child was restored, the mothers appeared to feel more

comfortable seeking conversation rather than compliance from their children.

Procedural Considerations

Various characteristics of the design and the procedure may also have impacted on the results obtained. For example, the communication mode conditions may not have been of sufficient length to adduce evidence of changes in maternal interactional behavior as related to directiveness. Variables such as the artificiality of the experimental situation, the unrestricted nature of the free play situation, and the somewhat large number of toys available may have resulted in too much potential for individual variation and insufficient structure for targeting the behaviors of interest. Amendments and additions to the scoring system may also have lead to more clear distinctions in maternal behavior across the communication mode conditions.

Implications

The results reported here would indicate that some additions could be made in early intervention programming for hearing-impaired children and their mothers. It would appear that the provision of an augmentative form of communication to such dyads may not be sufficient to bring about significant change in

maternal maladaptive responses to child hearing loss. Thus, training of interactional skills and of how to more effectively implement an additional mode of communication, such as sign language, may be of both short- and long-term benefit to hearing parents and their deaf children.

In light of the unlimited visual communication that hearing mother/deaf child pairs can, and do, take advantage of (Wedell-Monnig & Lumley, 1980), future research endeavors may include the analyses of non-linguistic controlling behaviors. In addition, between-group studies involving hearing mothers who use sign language, hearing mothers who rely on speech alone, and a normal hearing comparison group may shed further light on the subtle, yet significant, differences which may exist in maternal interaction patterns.

Conclusion

Results of this study indicate that hearing mothers of deaf children may exhibit relatively consistent levels of interactive control even when an additional mode of communication is available to the dyad. The extent to which this compares with mothers of deaf children who rely exclusively on verbal

communication cannot be determined without a comparison study.

While overall proportions of controlling behavior did not appear to vary across the experimental conditions with any regularity, there appeared to be evidence that changes in degree of maternal control varied as a function of communication mode. These more subtle differences in the kinds of control exerted may have been influenced by augmenting the mother/child communication pattern with communication modes which were more easily accessible to the child.

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APPENDIX A
Schedule of Subject Participation
Pilot Study

DAY I

Play

Goal

40 min.

DAY II

Goal

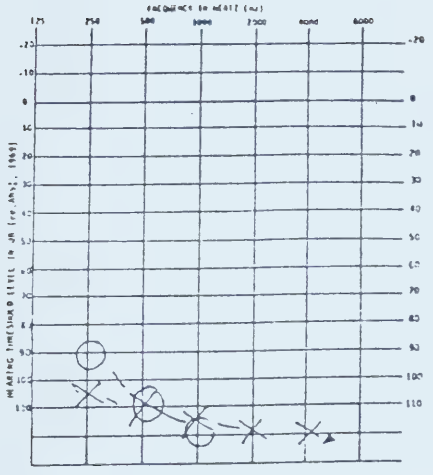
Play

40 min.

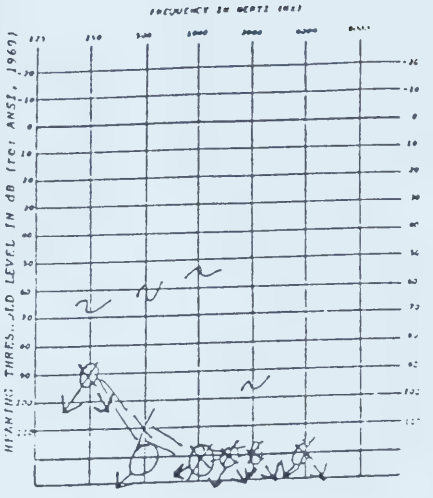
VS = Verbal + Sign V = Verbal Only

APPENDIX B
Children's Audiograms

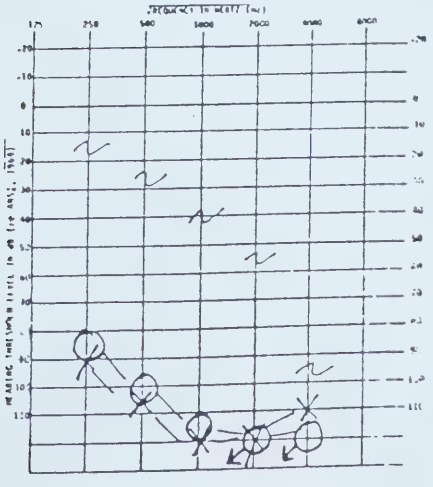
CHILDREN'S AUDIOGRAMS



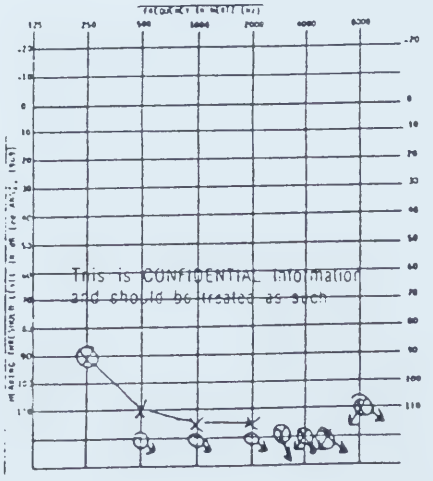
Child #1 Age 4 years 5 months



Child #2 Age 3 years 6 months



Child #3 Age 4 years 7 months



Child #4 Age 3 years 11 months

APPENDIX C
Equipment

Videotape Equipment

Panasonic Colour Television Model PC-20L13

JVC Videotape Recorder Model Br-3000U

JVC Satican Colour Video Camera Model GX-5700U

PX-18 PZM Microphone and Transformer Power Supply

Peles Time/Date Generator Model TDG200DT

3M T120 VHS Professional Videocassette

FM System

Phonic Ear Transmitter Model PE441T Receiver Model PE442R

Toys

Fisher-Price House and accessories

Fisher-Price Stove and accessories

Miss Piggy Jack-in-the-Box

See 'n Say Farm Animals

Two plastic telephones

Cash Register

Farm Animal Set

Large doll

Large car

Small car

Truck

Shapes in Can

Musical Drum

Tamborine

Noise makers

Bubbles

Top

Clock

Wind-Up Figures

Music Box Radio

Balls

Train

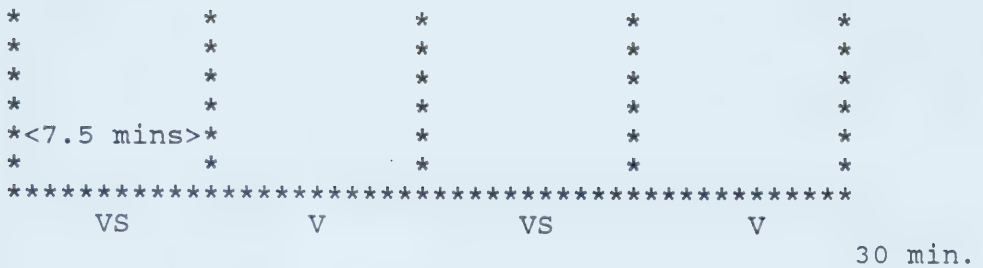
Dog

APPENDIX D

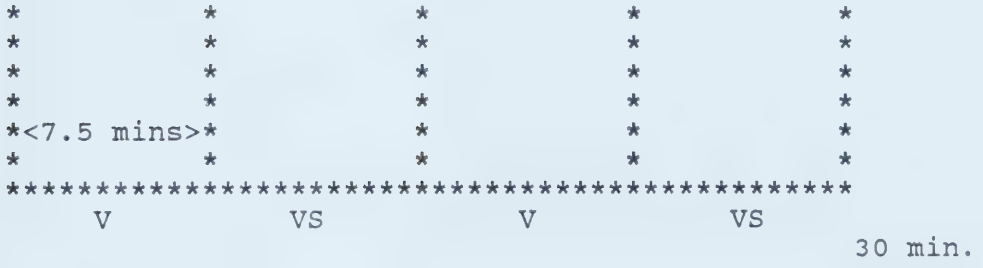
Schedule of Subject's Participation

Main Study

Day 1



Day 2



VS = Verbal + Sign V = Verbal Only

APPENDIX E
Transcription Guidelines and Reliability Procedures

Transcription Guidelines

Neither capitalization nor punctuation will be included on the transcript.

Utterance boundaries will be defined by the following:

1. Meaning - complete sentence structures will be transcribed separately despite limited intervening pause times or intonation changes.
   e.g. "What's that, what is that?"
   transcribed as 1. what's that
   2. what is that

2. Intonation - completion of utterances may be determined by a) falling intonation in the case of statements or imperatives
   b) rising intonation in the case of question forms.

3. Pause time - sentence structures, regardless of completeness, which are separated by percpetible pauses will be listed separately.
   e.g. "What about.....Go get the doll"
   transcribed as 1. what about
   2. go get the doll

4. Interjections, OK's and Oh's, etc.
   a) if tagged on to the end of a sentence structure, it will be included as part of the utterance.
   e.g. i) "Please sit down, OK?"
   transcribed as 1. please sit down ok
   ii) "OK, let's play with the house!"
   transcribed as 1. ok let's play with the house

   b) if presented following a perceptible pause, it will be listed as a separate utterance.
   e.g. "Come sit over here. OK?"
   transcribed as 1. come sit over here
   2. ok

5. Incomplete sentence structures - intonation and pause time will be used to determine utterance boundaries.
   a) incomplete structure followed by a complete structure with little/no pause time and no discernible change in intonation, list as two separte utterances.

e.g. "I'm not Oh look at that!"
transcribed as 1. i'm not
2. oh look at that

b) false starts - incomplete structure followed by a completion of the same thought, list as a single utterance, regardless of pause time.
e.g. "Maybe he'll...maybe he'll come over soon."
transcribed as 1. maybe he'll maybe he'll come over soon

Reliability Procedures

1. Words spoken - word by word count of agreements versus disagreements.
e.g. Transcription #1 Transcription #2
a) what is that what is that
100% agreement

b) come on over here come over here

$$\frac{\text{3 agreements}}{\text{3 agreements + 1 disagreement}} = 75\%$$

2. Utterance boundaries - judged by first word and last word of a transcribed utterance.
e.g. Transcription #1 Transcription #2
come sit down come sit down > agree
over here ok over here] disagree
ok]
what's that what's that > agree
hey hey what is that] disagre
what is that]

$$\frac{\text{2 agreements}}{\text{2 agreements + 2 disagreements}} = 50\%$$

APPENDIX F

Tables - Maternal Controlling Behavior

Table 5. DYAD #1 DAY #1 Maternal Controlling Behaviors

A. Controlling vs. Non-controlling Behaviors

	Verbal + Sign		Verbal		Verbal + Sign		Verbal	
	#	%	#	%	#	%	#	%
Control	42	61	43	64	35	45	45	56
Non-control	27	39	23	36	42	55	35	44
Total	69		67		77		80	

= raw number % = percentage of total utterances

B. Types of Controlling Behaviors

	Verbal + Sign		Verbal		Verbal + Sign		Verbal	
	#	%	#	%	#	%	#	%
Directives								
Direct	10	24	3	7	4	11	10	22
Indirect	14	33	13	30	8	23	9	20
Direct Prompt	-	0	-	0	-	0	-	0
Attention	-	0	2	5	-	0	-	0
Total		57		42		34		42
High Constraint								
Repair	2	5	15	35	5	14	3	7
Test	7	17	1	2	4	11	8	18
Question Prompt	-	0	-	0	-	0	1	4
Total		22		37		25		29
Moderate Constraint								
Real	8	19	8	19	10	28	7	16
Low Constraint								
Verbal Reflect	-	0	3	7	4	11	5	11
Action Reflect	-	0	-	0	-	0	-	0
Report	-	0	-	0	-	0	-	0
Permission	1	2	-	0	-	0	-	0
Total		2		7		11		11

= raw number % = percentage of controlling utterances

Table 7. DYAD #2 DAY #1 Maternal Controlling Behaviors

A. Controlling vs. Non-controlling Behaviors

	Verbal + Sign		Verbal		Verbal + Sign		Verbal	
	#	%	#	%	#	%	#	%
Control	65	55	79	58	56	45	59	50
Non-control	53	45	58	42	68	55	59	50
Total	118		137		124		118	

= raw number % = percentage of total utterances

B. Types of Controlling Behaviors

	Verbal + Sign		Verbal		Verbal + Sign		Verbal	
	#	%	#	%	#	%	#	%
Directives								
Direct	34	52	40	51	19	34	19	32
Indirect	2	3	4	5	7	13	3	5
Direct Prompt	1	2	-	0	-	0	1	2
Attention	1	2	-	0	1	2	2	3
Total		59		56		49		42
High Constraint								
Repair	1	2	3	4	-	0	3	5
Test	10	15	3	4	10	18	15	25
Question Prompt	3	5	2	3	5	9	2	3
Total		22		11		27		33
Moderate Constraint								
Real	10	15	12	15	6	11	7	12
Low Constraint								
Verbal Reflect	-	0	9	11	4	7	5	8
Action Reflect	3	5	5	6	3	5	2	3
Report	-	0	-	0	-	0	-	0
Permission	-	0	1	1	1	2	-	0
Total		5		18		14		11

= raw number % = percentage of controlling utterances

Table 6. DYAD #1 DAY #2 Maternal Controlling Behaviors

A. Controlling vs. Non-controlling Behaviors

	Verbal		Verbal + Sign		Verbal		Verbal + Sign	
	#	%	#	%	#	%	#	%
Control	42	71	40	57	23	55	38	59
Non-control	17	29	30	43	19	45	26	41
Total	59		70		42		64	

= raw number % = percentage of total utterances

B. Types of Controlling Behaviors

	Verbal		Verbal + Sign		Verbal		Verbal + Sign	
	#	%	#	%	#	%	#	%
Directives								
Direct	15	36	13	32	1	4	10	26
Indirect	9	21	8	20	10	43	8	21
Direct Prompt	-	0	-	0	-	0	-	0
Attention	8	19	1	3	1	4	-	0
Total		76		55		51		47
High Constraint								
Repair	-	0	1	3	4	17	8	21
Test	6	14	2	5	4	17	1	3
Question Prompt	-	0	-	0	-	0	-	0
Total		14		8		34		24
Moderate Constraint								
Real	3	7	15	38	3	13	8	21
Low Constraint								
Verbal Reflect	1	2	-	0	-	0	3	8
Action Reflect	-	0	-	0	-	0	-	0
Report	-	0	-	0	-	0	-	0
Permission	-	o	-	0	-	0	-	0
Total		2	-	0		0		8

= raw number % = percentage of controlling utterances

Table 8. DYAD #2 DAY #2 Maternal Controlling Behaviors

A. Controlling vs. Non-controlling Behaviors

	Verbal		Verbal + Sign		Verbal		Verbal + Sign	
	#	%	#	%	#	%	#	%
Control	55	43	75	47	38	30	62	47
Non-control	72	57	85	53	89	70	69	53
Total	127		160		127		131	

= raw number % = percentage of total utterances

B. Types of Controlling Behaviors

	Verbal		Verbal + Sign		Verbal		Verbal + Sign	
	#	%	#	%	#	%	#	%
Directives								
Direct	26	47	21	28	18	47	10	16
Indirect	9	16	11	15	7	18	10	16
Direct Prompt	-	0	2	3	-	0	1	2
Attention	2	4	1	1	1	3	5	8
Total		67		47		68		42
High Constraint								
Repair	-	0	5	7	3	8	7	11
Test	8	15	7	9	3	8	10	16
Question Prompt	2	4	2	3	-	0	2	3
Total		19		19		16		30
Moderate Constraint								
Real	3	5	18	24	5	13	13	21
Low Constraint								
Verbal Reflect	2	4	5	7	1	3	3	5
Action Reflect	3	5	3	4	-	0	1	2
Report	-	0	-	0	-	0	-	0
Permission	-	0	-	0	-	0	-	0
Total		9		11		3		7

= raw number % = percentage of controlling utterances

Table 9. DYAD #3 DAY #1 Maternal Controlling Behaviors

A. Controlling vs. Non-controlling Behaviors

	Verbal + Sign		Verbal		Verbal + Sign		Verbal	
	#	%	#	%	#	%	#	%
Control	48	47	51	42	35	37	42	39
Non-control	54	53	71	58	69	63	69	61
Total	102		122		104		111	

= raw number % = percentage of total utterances

B. Types of Controlling Behaviors

	Verbal + Sign		Verbal		Verbal + Sign		Verbal	
	#	%	#	%	#	%	#	%
Directives								
Direct	3	6	9	18	7	20	3	8
Indirect	10	21	10	20	9	26	13	33
Direct Prompt	1	2	-	0	-	0	-	0
Attention	7	15	2	4	-	0	1	3
Total		44		42		46		44
High Constraint								
Repair	4	8	7	14	8	23	9	23
Test	7	15	8	16	12	34	-	0
Question Prompt-		0	-	0	-	0	-	0
Total		23		30		57		23
Moderate Constraint								
Real	9	19	10	20	3	9	9	23
Low Constraint								
Verbal Reflect	6	13	5	10	2	6	6	15
Action Reflect	1	2	-	0	4	11	1	3
Report	-	0	-	0	-	0	-	0
Permission	-	0	-	0	-	0	-	0
Total		15		10		17		18

= raw number % = percentage of controlling utterances

Table 10. DYAD #3 DAY #2 Maternal Controlling Behaviors

A. Controlling vs. Non-controlling Behaviors

	Verbal		Verbal + Sign		Verbal		Verbal + Sign	
	#	%	#	%	#	%	#	%
Control	66	46	56	56	52	45	39	36
Non-control	76	54	44	44	64	55	69	64
Total	142		100		116		108	

= raw number % = percentage of total utterances

B. Types of Controlling Behaviors

	Verbal		Verbal + Sign		Verbal		Verbal + Sign	
	#	%	#	%	#	%	#	%
Directives								
Direct	8	12	20	36	9	17	2	5
Indirect	31	47	19	34	24	46	16	41
Direct Prompt	-	0	-	0	-	0	-	0
Attention	-	0	2	4	2	4	1	3
Total		59		74		67		49
High Constraint								
Repair	6	9	7	13	1	2	8	21
Test	7	11	-	0	5	10	1	3
Question Prompt	-	0	-	0	-	0	1	3
Total		20		13		12		27
Moderate Constraint								
Real	9	14	7	13	9	17	9	23
Low Constraint								
Verbal Reflect	3	5	1	2	-	0	-	0
Action Reflect	1	2	-	0	2	2	1	3
Report	-	0	-	0	-	0	-	0
Permission	1	2	-	0	-	0	-	0
Total		9		2		2		3

= raw number % = percentage of controlling utterances

Table 11. DYAD #4 DAY #1 Maternal Controlling Behaviors

A. Controlling vs. Non-controlling Behaviors

	Verbal + Sign		Verbal		Verbal + Sign		Verbal	
	#	%	#	%	#	%	#	%
Control	92	60	90	63	69	56	96	55
Non-control	62	40	53	37	54	44	80	45
Total	154		143		123		176	

= raw number % = percentage of total utterances

B. Types of Controlling Behaviors

	Verbal + Sign		Verbal		Verbal + Sign		Verbal	
	#	%	#	%	#	%	#	%
Directives								
Direct	22	24	28	31	21	30	19	20
Indirect	13	14	16	18	11	16	25	26
Direct Prompt	1	1	-	0	-	0	1	1
Attention	4	4	13	14	6	9	19	20
Total		43		63		55		67
High Constraint								
Repair	3	3	2	2	3	4	-	0
Test	26	28	20	22	14	20	26	27
Question Prompt	1	1	1	1	2	3	1	1
Total		32		24		27		28
Moderate Constraint								
Real	13	14	6	7	9	13	4	4
Low Constraint								
Verbal Reflect	7	8	1	1	1	1	1	1
Action Reflect	2	2	3	3	1	1	-	0
Report	-	0	-	0	-	0	-	0
Permission	-	0	-	0	-	0	-	0
Total		10		4		2		1

= raw number % = percentage of controlling utterances

Table 12. DYAD #4 DAY #2 Maternal Controlling Behaviors

A. Controlling vs. Non-controlling Behaviors

	Verbal		Verbal + Sign		Verbal		Verbal + Sign	
	#	%	#	%	#	%	#	%
Control	81	52	75	61	65	56	51	55
Non-control	74	48	47	39	52	44	42	45
Total	155		122		117		93	

= raw number % = percentage of total utterances

B. Types of Controlling Behaviors

	Verbal		Verbal + Sign		Verbal		Verbal + Sign	
	#	%	#	%	#	%	#	%
Directives								
Direct	23	28	20	27	18	28	13	25
Indirect	25	31	9	12	22	33	13	25
Direct Prompt	-	0	3	4	-	0	-	0
Attention	8	10	8	11	3	5	4	8
Total		69		54		66		58
High Constraint								
Repair	-	0	-	0	-	0	-	0
Test	20	25	23	31	8	12	3	6
Question Prompt	-	0	1	1	-	0	1	2
Total		25		32		12		8
Moderate Constraint								
Real	4	5	1	1	11	17	7	14
Low Constraint								
Verbal Reflect	-	0	4	5	1	2	2	4
Action Reflect	1	1	6	8	2	3	8	16
Report	-	0	-	0	-	0	-	0
Permission	-	0	-	0	-	0	-	0
Total		1		13		5		20

= raw number % = percentage of controlling utterances

APPENDIX G
Figures

Figure 1. DYAD #1 Percentage Controlling Behavior by Communication Mode

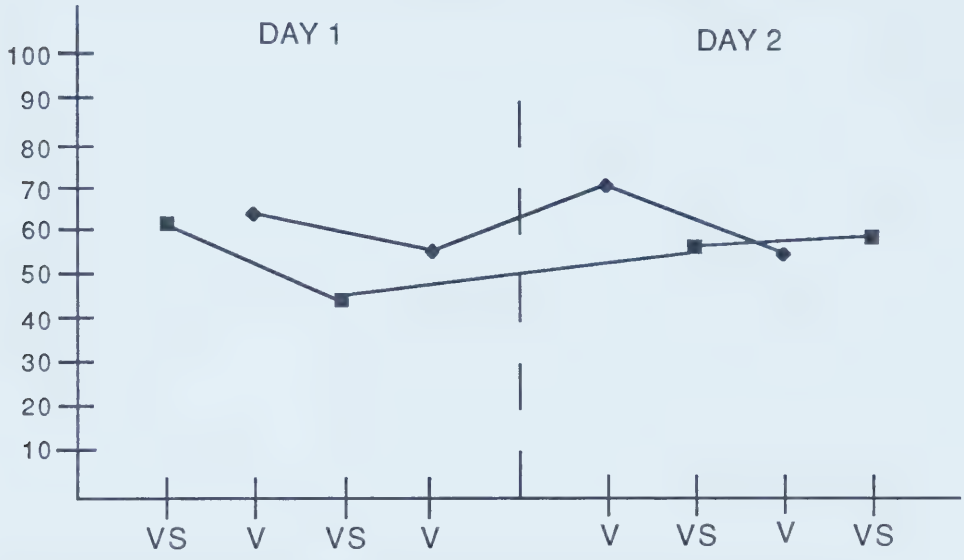


Figure 2. DYAD #2 Percentage Controlling Behavior by Communication Mode

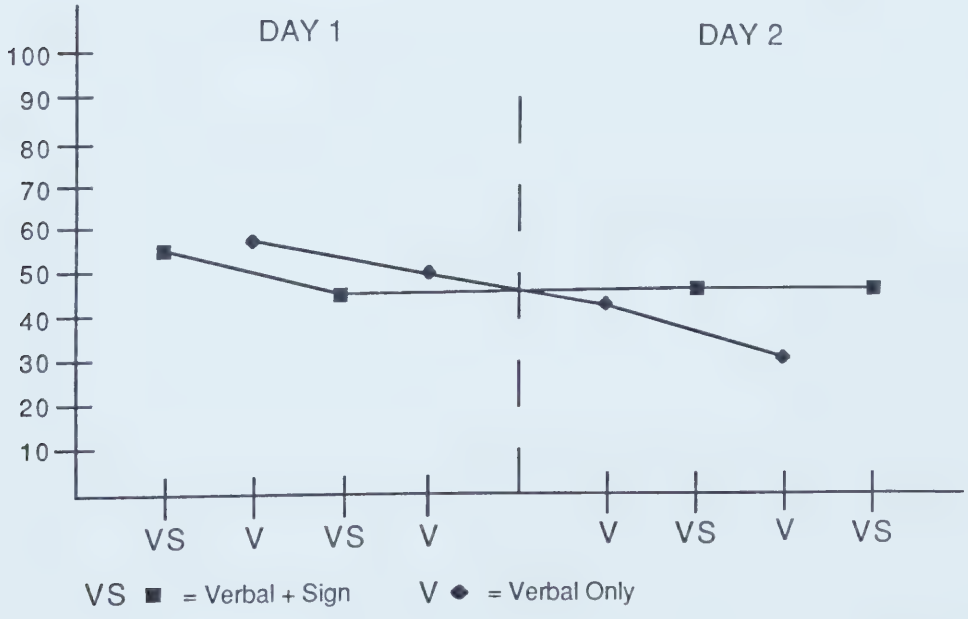


Figure 3. DYAD #3 Percentage Controlling Behavior by Communication Mode

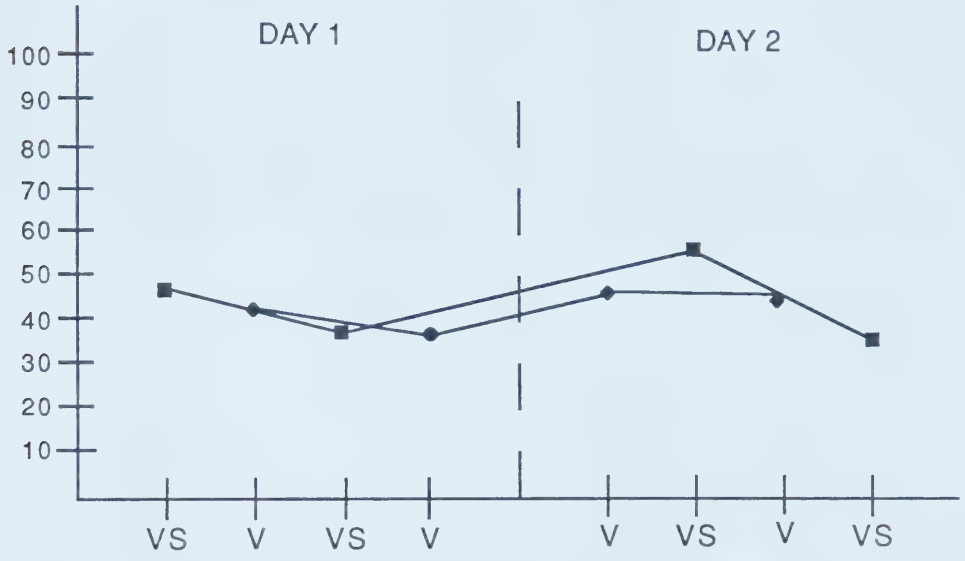


Figure 4. DYAD #4 Percentage Controlling Behavior by Communication Mode

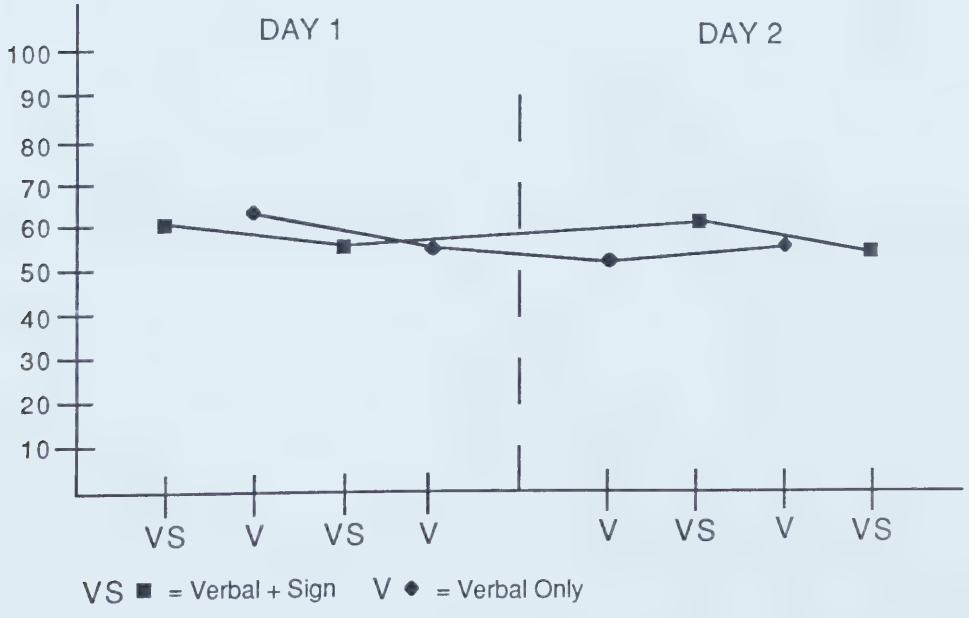


Figure 5. DYAD #1 Percentage of Types of Controlling Behavior by Communication Mode.

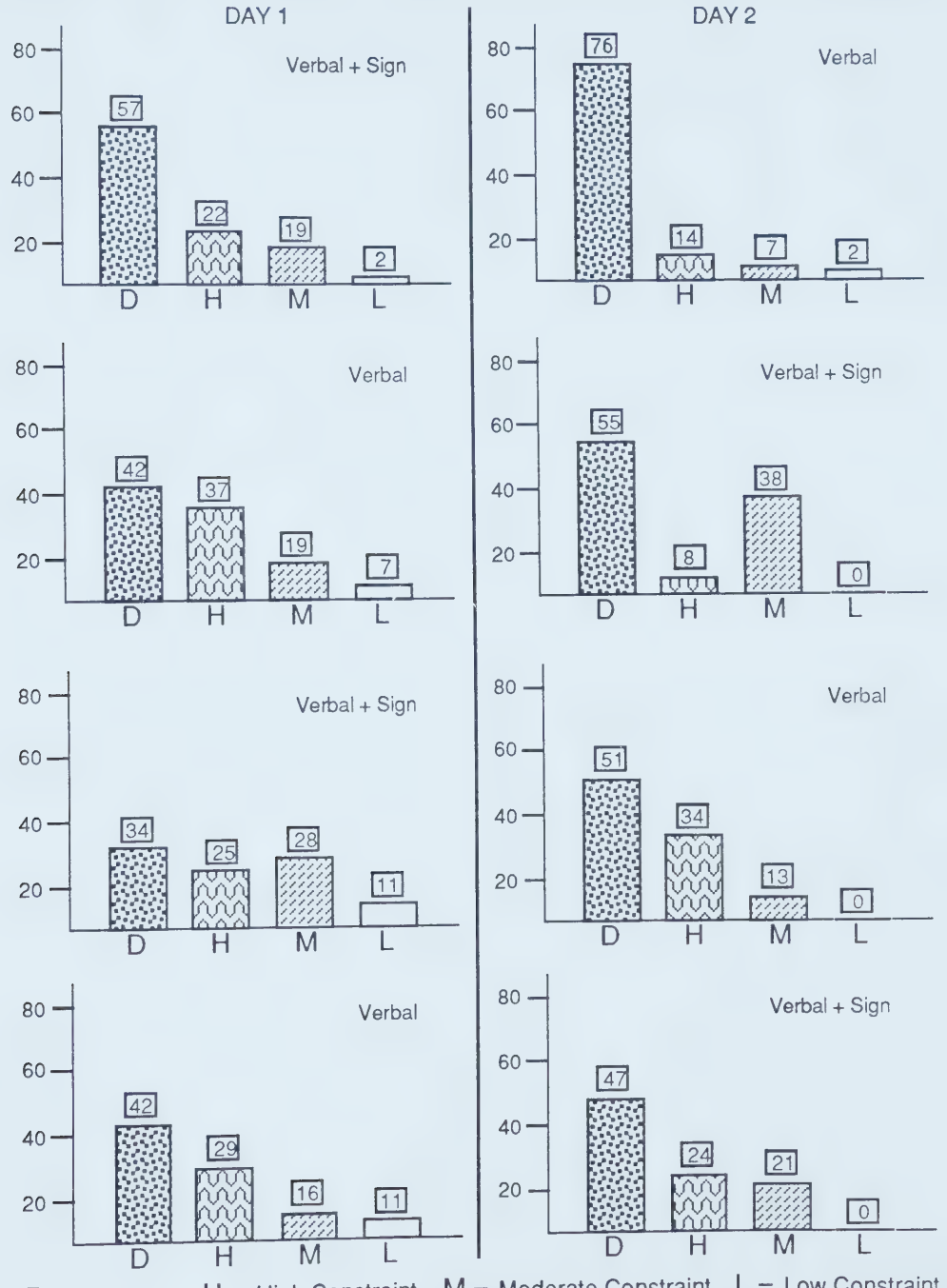


Figure 6. DYAD #2 Percentage of Types of Controlling Behavior by Communication Mode.

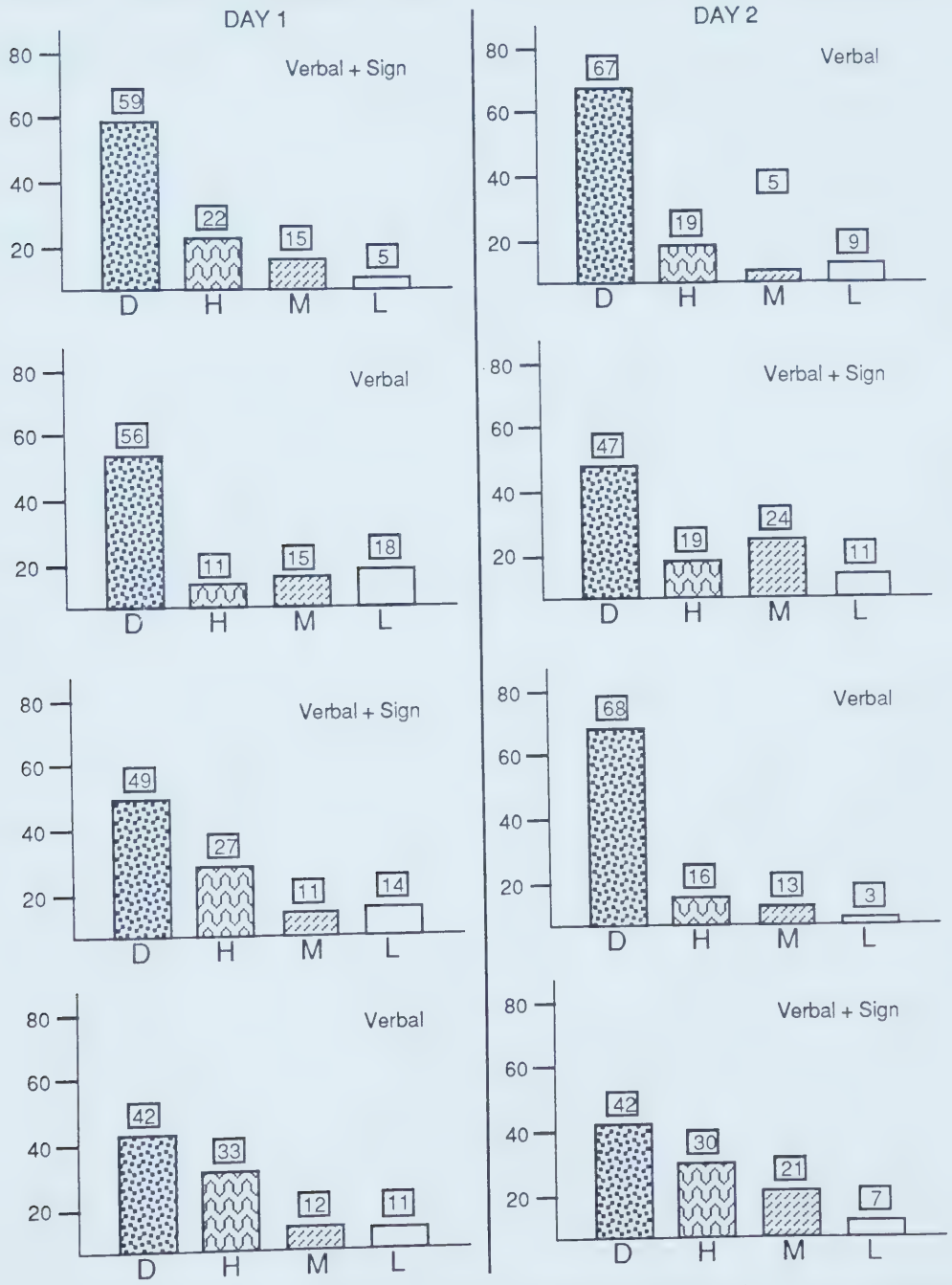


Figure 7. DYAD #3 Percentage of Types of Controlling Behavior by Communication Mode.

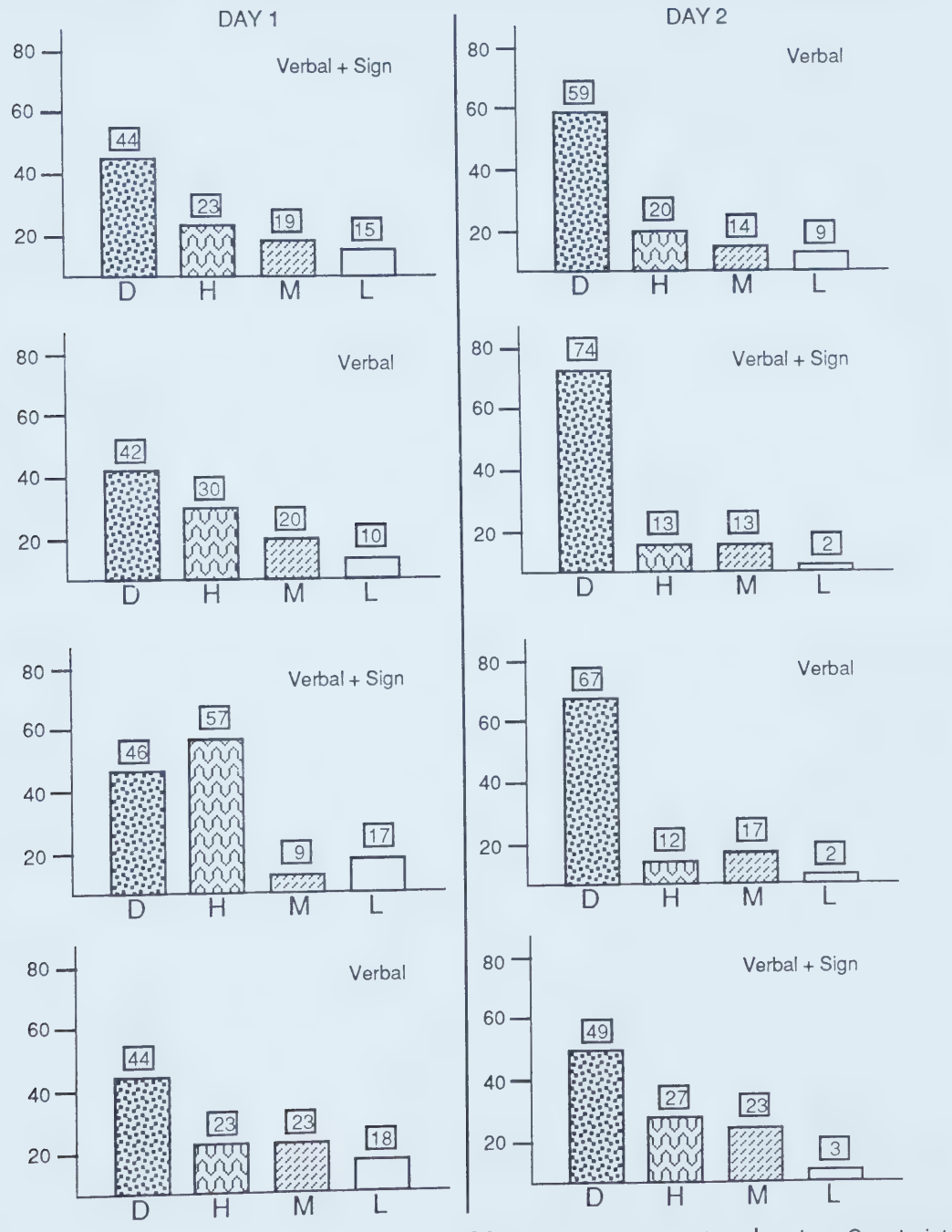
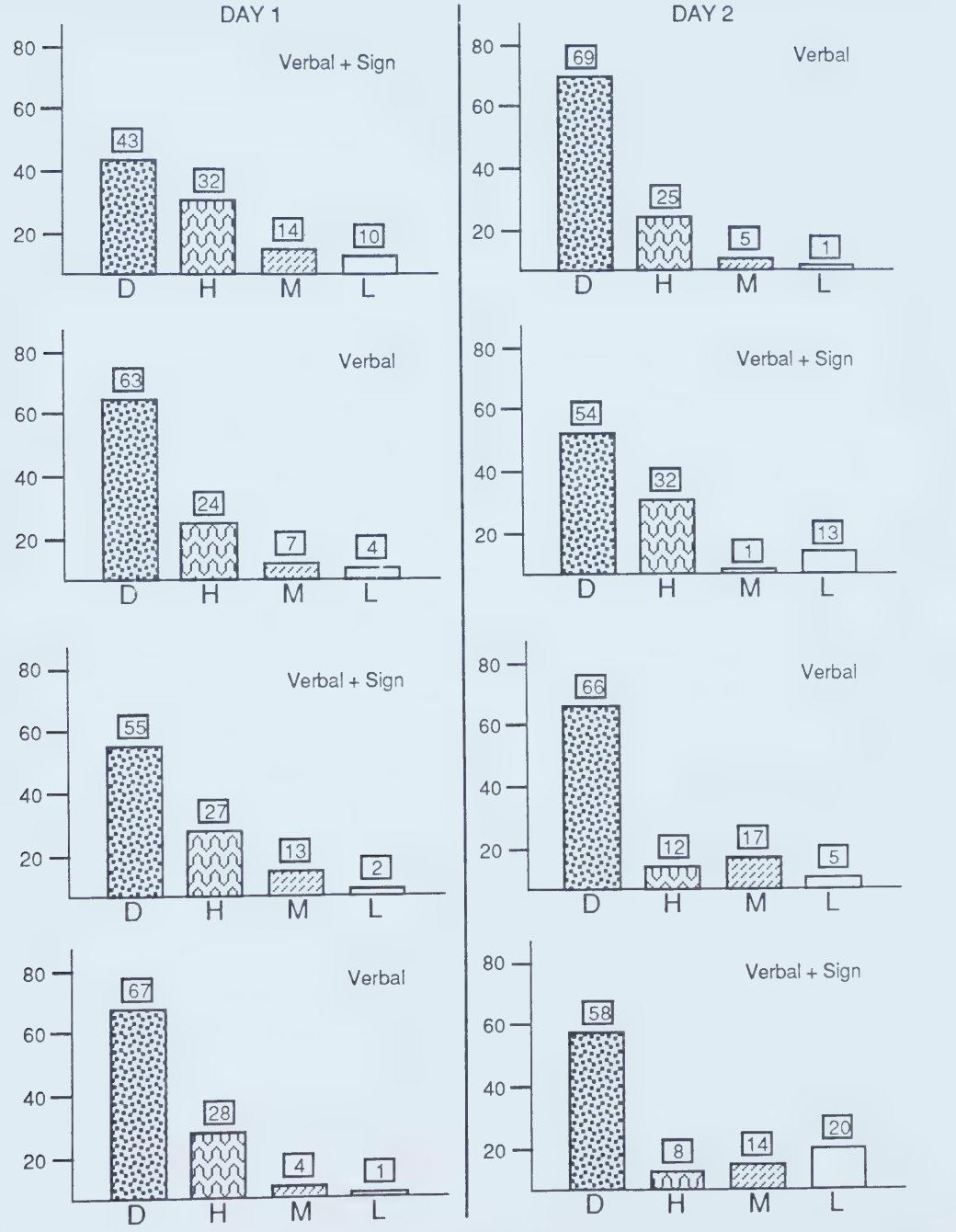


Figure 8. DYAD #4 Percentage of Types of Controlling Behavior by Communication Mode.



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